Operational Amplifier

Part number		Function*1			Recommended power supply voltage*2 (V)	Common mode input voltage range TYP. (V) T_A = +25 °C	Input stage transistor	GND Input/Output on single power	Low V_{IO} Low T_A drift	Low input bias current	High speed	Wide band	Low noise	Low power	Packages*3				Number of pins
Communication/industry use	General use	Single	Dual	Quad											D ED	C	G2	HA	
μPC151	**μPC741**	○			±7.5 to ±16	V^-+2 to $V^+-0.5$	NPN		○						○	○	○		8
μPC251	**μPC1458**		○												○	○	○		8
μPC354		○			±3 to ±16	V^-+1 to V^+-1	NPN		⊚	◎			○		○				8
μPC454			○												○				14
μPC815		○			±3 to ±20	$V^-+1.5$ to $V^+-2.5$	NPN		⊚	○			⊚		○	○			8
μPC816		○			±3 to ±20	$V^-+1.5$ to $V^+-2.5$	NPN		⊚	○	○	◎	⊚		○	○			8
μPC802	**μPC4250**	○			±1 to ±16	$V^-+0.2$ to $V^+-0.6$	PNP		○	○				◎		○	○		8
μPC801	**μPC4081**	○			±5 to ±16	$V^-+2.3$ to V^+	J–FET			◎	○	○				○	○		8
μPC803	**μPC4082**		○													○	○		8
μPC804	**μPC4084**			○												○			14
μPC811		○			±5 to ±16	V^-+3 to V^+-1	J–FET		○	◎	○	○	○			○	○		8
μPC812			○													○	○		8
μPC813		○			±5 to ±16	V^-+3 to V^+-1	J–FET		○	◎	◎	○	○			○	○		8
μPC814			○													○	○		8
μPC821	**μPC4071**	○			±5 to ±16	V^-+2 to V^+	J–FET			◎	○	○	○			○	○		8
μPC822	**μPC4072**		○													○	○	○	8*4
μPC824	**μPC4074**			○												○	○		14
μPC831	**μPC4061**	○			±2 to ±16	V^-+2 to V^+	J–FET			◎				○		○	○		8
μPC832	**μPC4062**		○													○	○		8
μPC834	**μPC4064**			○												○	○		14
μPC258	**μPC4558**		○		±4 to ±16	V^-+1 to V^+-1	PNP		○			○	○		○	○	○		8
μPC458	**μPC4741**			○											○	○	○		14
μPC259	**μPC4560**		○		±4 to ±16	V^-+1 to V^+-1	PNP		○			○	○			○	○		8
	μPC4556		○		±4 to ±16	V^-+1 to V^+-1	PNP		○		○	◎	○			○	○		8
	μPC4557		○		±4 to ±16	V^-+1 to V^+-1	PNP		○			○	○			○			8
	μPC4559		○		±4 to ±16	V^-+1 to V^+-1	PNP		○			○	○			○			8
	μPC4570		○		±4 to ±16	V^-+1 to V^+-1	PNP		○		○	◎	◎			○	○	○	8*4
	μPC4574			○												○	○		14
	μPC4572		○		±2 to ±7	V^-+1 to V^+-1	PNP		○		○	◎	◎			○	○	○	8*4
μPC1251	**μPC358**		○		+3 to ±30	GND to $V^+-1.5$	PNP	○		○				○	○	○	○	○	8*4
μPC451	**μPC324**			○											○	○	○		14
μPC452	**μPC3403**			○	+3 to ±32	GND to $V^+-1.5$	PNP	○		○						○	○		14
μPC842			○		±3 to ±32	GND to $V^+-1.8$	PNP	○			○	○				○	○		8
μPC844				○												○	○		14

○: Recommended for designing ◎: High performance ⊚: Very high performance

*1 : Single type has a offset adjust pin.
*2 : For product indicated by +/– voltage, single supply voltage operation is possible if the input/output voltage range is observed.
*3 : C, D, ED, G2 or HA shows Package Type, as follows.
C : Plastic DIP (300 mil)
D, ED : Ceramic DIP (300 mil)
G2 : Plastic SOP (225 mil)
HA : 9-pin plastic slim SIP
*4 : HA has 9 pins.

Comparator

Part number: Communication/ industry use	Part number: General use	Function: Single	Function: Dual	Function: Quad	Recommended power supply voltage (V)	Common mode input voltage range TYP. (V) T_A = +25 °C	Input stage transistor	GND Input on single power	High speed	Low power	Output circuit type: Open-collector	Output circuit type: Emitter-follower	Packages*1: D ED	Packages*1: C	Packages*1: G2	Packages*1: HA	Number of pins
µPC271	µPC311	○			+5 to +32	V^-+0.3 to V^+–1.2	PNP		○		○	○	○	○	○		8
µPC272	µPC319		○		+5 to +32	V^-+2 to V^+–2	NPN		○		○		○	○	○		14
µPC277	µPC393		○		+2 to +32	GND to V^+–1.5	PNP	○		○	○		○	○	○	○	8*2
µPC177	µPC339			○									○	○	○		14

*1 : C, D, ED, G2 or HA shows Package Type, as follows.
C : Plastic DIP (300 mil)
C : Plastic DIP (300 mil)
D, ED : Ceramic DIP (300 mil)
G2 : Plastic SOP (225 mil)
HA : 9-pin plastic slim SIP
*2 : HA has 9 pins.

Fixed Output Voltage, 3-Terminal Regulator

Type	Part number	Output current (A)	3	3.3	4	5	6	7	8	9	9.3	10	12	15	18	24	Input voltage (V)	Total power dissipation (W)*1	Package	Remarks
Positive voltage output	µPC78L00	0.1				○	○	○	○								30	0.7/2*3	• TO-92 • SOT-89	
												○	○	○			35			
	µPC78N00	0.3				○			○			○	○	○	○		35	12.5	• TO-126	
																○	40			
	µPC78M00A	0.5				○	○	○	○	○		○	○	○	○		35	15	• MP-45*2	Improved version of µPC78M00
																○	40			
	µPC7800A	1.0				○			○		○		○	○	○		35	15	• MP-45*2	Improved version of µPC7800
																○	40			
	µPC29L00	0.1	○	○	○	○											16	0.7/2*3	• TO-92 • SOT-89	Low dropout voltage type
	µPC29M00	0.5	○	○		○			○	○		○	○				20	1.0/2.0*4 15	• MP-3 • MP-3Z*5 • MP-45*2	Low dropout voltage type
	µPC2900	1.0	○	○		○			○	○		○	○				20	1.0/2.0*4 15	• MP-3 • MP-3Z*5 • MP-45*2	Low dropout voltage type
	µPC24A00	2.0				○							○	○			36	20	• MP-45*2	Low dropout voltage type
	µPC24M00A	0.5				○	○	○	○	○		○	○	○	○		36	15	• MP-45*2	Low dropout voltage type
	µPC2400A	1.0				○	○	○	○	○		○	○	○	○		36	15	• MP-45*2	Low dropout voltage type
Negative voltage output	µPC79L00	0.1				○			○								–30	0.7	• TO-92	
													○	○			–35			
	µPC79N00	0.3				○			○				○	○	○		–35	12.5	• TO-126	
																○	–40			
	µPC79M00	0.5				○			○				○	○	○		–35	15	•MP-45*2	
																○	–40			
	µPC7900A	1.0				○			○				○	○	○		–35	15	• MP-45*2	Improved version of µPC7900
																○	–40			

*1 : Limited by internal circuit
*2 : TO-220 Plastic insulated package
*3 : With 16 cm^2 × 0.7 mm ceramic substrate
*4 : With 7.5 cm^2 × 0.7 mm ceramic substrate
*5 : Surface mount package of MP-3

Variable Output Voltage Regulator

Type	Part number	Output current (A)	Output voltage range (V)	Absolute maximum ratings		Package	Remarks
				Input voltage (V)	Total power dissipation (W)		
Positive voltage output	*μ*PC141/305*3	0.05	4.5 to 30	40	0.35, 0.5/0.35, 0.44	• 8-pin DIP (plastic/ceramic) • 8-pin SOP	
	*μ*PC317	1.5	1.3 to 30	40	15*1	• MP-45*2	3-pin regulator
	*μ*PC1093	0.15	2.5 to 36	37	0.48, 0.7, 2*4	• 8-pin SOP • TO-92 • SOT-89	Shunt regulator
	*μ*PC1943	0.05	1.26 to 24	25	1.6*4	• SOT-89	Shunt regulator for Low Voltage
	*μ*PC1944	0.05	1.26 to 24	25	0.385, 0.56	• 8-pin SOP • TO-92	Shunt regulator for Low Voltage
Negative voltage output	*μ*PC337	1.5	–1.3 to –30	–40	20*1	• TO-220AB	3-pin regulator

*1 : Limited by internal circuit
*2 : Plastic insulated package
*3 : μPC141 is for communication/industry use.
*4 : When mounted on 16 cm^2 (0.7 mm thick) ceramic board

Regulator with System Reset

Type	Part number	Output current (A)	Output voltage (V)	Reset start voltage (V)	Reset output logic		Absolute maximum ratings		Package	Remarks
					Active low	Active high	Input voltage (V)	Total power dissipation (W)		
Positive voltage output	*μ*PC2251	0.1	3	2.85	○		12	1.2*	• TO-126 (4-pin)	Low dropout type
	*μ*PC2252	0.1	3	2.85		○	12	1.2*	• TO-126 (4-pin)	Low dropout type
	*μ*PC2253	0.1	5	2.85	○		12	1.2*	• TO-126 (4-pin)	Low dropout type
	*μ*PC2254	0.1	5	2.85		○	12	1.2*	• TO-126 (4-pin)	Low dropout type
	*μ*PC2255	0.1	5	4.75	○		12	1.2*	• TO-126 (4-pin)	Low dropout type
	*μ*PC2256	0.1	5	4.75		○	12	1.2*	• TO-126 (4-pin)	Low dropout type
	*μ*PC2260	0.5	5	4.85	○		35	20*	• TO-220 (5-pin)	Low dropout type
Supervisory for Micro-processor	*μ*PC2270A	–	–	4.3	○	○	8	0.35	• 8-pin DIP	Manual Reset Input
								0.44	• 8-pin SOP	
								0.35	• 9-pin Slim SIP	
	*μ*PC1074A	0.01	2 ~ 5.18	Adjust-able	○		40	0.5	•16-pin SOP	Watch-dog Timer

*: Limited by internal circuit

High Precision Reference Voltage

Part number	Input voltage range (V)	Output voltage (V)	Output current (mA)	Total power dissipation (mW)	Output voltage vs. temperature (ppm/°C)	Package
*μ*PC1060	4.5 to 40	2.5 ±0.025	10	350, 500	40	• 8-pin DIP (plastic, ceramic)

Switching Regulator Control Circuit

Part number	Input voltage range (V)	Absolute maximum ratings		Package	Output circuit operation mode	Applications
		Output current (mA)	Total power dissipation (W)			
μPC494	7 to 40	250	1, 0.78*2, 0.65*2	• 16-pin DIP (plastic) • 16-pin SOP*1	Push-pull/single selectable	General purpose
μPC1094	11 to 24	1200 (peak)	0.57, 0.55	• 14-pin DIP (plastic) • 14-pin SOP	Totem pole circuit configuration Single mode	Can operate up to 500 kHz General purpose
μPC1099	11.5 to 24	1200 (peak)	1, 0.694	• 16-pin DIP (plastic) • 16-pin SOP	Totem pole circuit configuration Single mode	Can operate up to 500 kHz General purpose
μPC1905	12 to 30	1200 (peak)	1, 0.694	• 16-pin DIP (plastic) • 16-pin SOP	Totem pole circuit configuration Single mode	Can operate up to 500 kHz General purpose
μPC1906	12 to 30	1200 (peak)	1, 0.694	• 16-pin DIP (plastic) • 16-pin SOP	Totem pole circuit configuration Single mode	Can operate up to 500 kHz General purpose
μPC1900	12 to 30	1200 (peak)	1.225, 0.775	• 24-pin DIP (plastic) • 24-pin SOP	Totem pole circuit configuration 2 outputs	Can operate up to 500 kHz General purpose
μPC1100	3.6 to 40	25	1, 0.694	• 16-pin DIP (plastic) • 16-pin SOP	2 outputs (synchronous control possible) If one output is shorted, both outputs will be turned OFF.	DC/DC converter
μPC1150	3.6 to 40	25	1, 0.694	• 16-pin DIP (plastic) • 16-pin SOP	2 outputs (synchronous control possible) If one output is shorted, only the output will be turned OFF.	DC/DC converter

*1 : μPC494G is 375 mil. μPC494GS is 300 mil.
*2 : When mounted on 5 × 5 cm^2 (1.6 mm thick) glass epoxy board.

Functional Block

Function	Part number	Features	Package
Analog Multiplexer	**μPD5205**	Single-pole 8 position mode/double-pole 4 position mode Supply Voltage: 44 V, ON Resistance: 270 Ω TYP.	• 24-pin shrink DIP • 24-pin SOP
Precision Timer	**μPC1555**	CR Timer, Operating Temperature: –20 ~ +80°C Supply Voltage: 4.5 ~ 16 V, Free Running Frequency: 0.1 ~ 100 kHz	• 8-pin DIP • 8-pin SOP
	μPD5555	CMOS CR Timer, CMOS Type of μPC1555 Supply Voltage: 3 ~ 16 V, Free Running Frequency: 0.1 ~ 500 kHz	• 8-pin DIP • 8-pin SOP
	μPD5556	CMOS CR Timer Dual Type of μPD5555	• 8-pin DIP • 8-pin SOP

For further information, please contact:

NEC Corporation
NEC Building
7-1, Shiba 5-chome, Minato-ku
Tokyo 108-01, Japan
Tel: 03-3454-1111
Fax: 03-3798-6059

[North & South America]

NEC Electronics Inc.
475 Ellis Street
Mountain View, CA 94043-2203
Tel: 415-960-6000
800-366-9782
Fax: 415-965-6130
800-729-9288

[Regional Sales Offices]

Central Region
Greenpoint Tower
2800 West Higgins
Road Suite 765
Hoffman Estates,
IL 60195
Tel: 708-519-3930
Fax: 708-519-9329

Norcal Region
4677 Old Ironsides Dr. Suite 450
Santa Clara, CA 95054, U.S.A.
Tel: 408-986-1020
Fax: 408-988-4165

Eastern Region
901 Lake Destiny Drive
Suite 320
Maitland, FL 32751, U.S.A.
Tel: 407-875-1145
Fax: 407-875-0962

Western Region
One Embassy Centre
9020 S.W. Washington
Square Road
Suite 400
Tigard, OR 97223, U.S.A.
Tel: 503-671-0177
Fax: 503-643-5911

NEC do Brasil S.A.
Rua Verguciro, 1759-Vila Mariana
CEP 04101-000
Sáo Paulo-SP, Brasil
Tel: 011-889-1680
Fax: 011-889-1689

[Europe]

NEC Electronics (Germany) GmbH
Kanzler Str.2,
40472 Düsseldorf
Germany
Tel: 0211-650302
Fax: 0211-6503490

Munich Office
Arabellastr. 17
81925 München, Germany
Tel: 089-921003-0
Fax: 089-913182

Stuttgart Office
Villastr. 1
70190 Stuttgart, Germany
Tel: 0711-16669-0
Fax: 0711-16669-19

Hannover Office
Koenigstr. 12
30175 Hannover, Germany
Tel: 0511-33402-0
Fax: 0511-33402-34

Benelux Office
Boschdijk 187a
5612 HB Eindhoven,
The Netherlands
Tel: 040-2445845
Fax: 040-2444580

Scandinavia Office
P.O.Box 134
18322 Taeby, Sweden
Tel: 8-6380820
Fax: 8-6380388

NEC Electronics (UK) Limited
Cygnus House, Sunrise Park Way,
Milton Keynes, MK14 6NP, U.K.
Tel: 01908-691-133
Fax: 01908-670-290

NEC Electronics (France) S.A.
9, rue Paul Dautier-BP 187
78142 Velizy-Villacoublay Cédex
France
Tel: 01-30-67-58-00
Fax: 01-30675899

Madrid Office
Juan Esplandiu, 15
28007 Madrid, Spain
Tel: 01-504-2787
Fax: 01-504-2860

NEC Electronics Italiana s.r.l.
Via Fabio Filzi, 25/A,
20124 Milano, Italy
Tel: 02-667541
Fax: 02-66754299

[Asia & Oceania]

NEC Electronics Hong Kong Limited
12/F., Cityplaza 4,
12 Taikoo Wan Road, Hong Kong
Tel: 2886-9318
Fax: 2886-9022/9044

Seoul Branch
10F, Ilsong Bldg, 157-37,
Samsung-Dong, Kangnam-Ku
Seoul, the Republic of Korea
Tel: 02-528-0303
Fax: 02-528-4411

NEC Electronics Taiwan Ltd.
7F, No. 363 Fu Shing North Road
Taipei, Taiwan, R. O. C
Tel: 02-719-2377
Fax: 02-719-5951

NEC Electronics Singapore Pte. Ltd.
101 Thomson Road #04-02/05
United Square, Singapore 307591
Tel: 253-8311
Fax: 250-3583

G96. 3

Document No. X10679EJCV0SG00 (12th edition)
Date published October 1996P

Printed in Japan